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TRIP REPORT: TAJIKISTAN AND KYRGYZSTAN FEBRUARY 2013

February 2013

This trip report was produced for review by the United States Agency for International Development. It was prepared by Alexander Trusov MD, PhD for the Quality Health Care Project in the Central Asian Republics.

The USAID Quality Health Care Project is a five-year program designed to improve the health of Central Asians by strengthening health care systems and services, particularly in the areas of HIV/AIDS and TB care and prevention. The project assists governments and communities to more effectively meet the needs of vulnerable populations, with the aim of increasing utilization of health services and improving health outcomes. The Quality Health Care Project is part of USAID's third objective of investing in people as part of the US Strategic Framework for Foreign Assistance.

Recommended Citation: Trusov, Alexander. February 2013. Trip Report: Kyrgyzstan and Tajikistan. USAID Quality Health Care Project in the Central Asian Republics, Abt Associates Inc.

The Quality Health Care Project is funded by the U.S. Agency for International Development under Contract No. AID-176-C-10-00001, beginning September 2010. The Quality Project is implemented by Abt Associates Inc. and its subcontractors AIDS Projects Management Group (APMG), Project HOPE, Scientific Technology and Language Institute (STLI), and Socium Consult.

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TRIP REPORT:

KYRGYZSTAN AND TAJIKISTAN

FEBRUARY 2013

The consultant acknowledges the support provided by the staff of the USAID Quality Health Care Project during the mission, the valuable insights of the persons interviewed regarding the TB control program and the contribution of the USAID Quality Health Care Project.

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List of abbreviations

ACSM	Advocacy, Communication and Social Mobilization
AFB	Acid-fast Bacilli
AIDS	Acquired immunodeficiency syndrome
BCG	Vaccine Calmette Guerin
CAR	Central Asian Republics
CBO	Community-based Organization
CPGs	Clinical Practice Guidelines
DOT	Directly observed treatment intake
DOTS	WHO-recommended TB control strategy
DST	Drug Susceptibility Test
EP	Extra pulmonary cases
EQA	External quality assurance
FAST	Find Actively Separate Treat
FLD	First line drugs
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
HIV	Human Immunodeficiency Virus
IC	Infection control
KNCV	Royal Netherlands TB Association
LMIS	Logistic Management Information System
MDR-TB	Multi-Drug Resistant Tuberculosis
M&E	Monitoring and Evaluation
MoH	Ministry of Health
NGOs	Non-government Organizations
NTP	National Tuberculosis Program

PHC	Primary Health Care
QMS	Quality Management System
SES	Sanitary Epidemiological Station
SLD	Second Line Drugs
SOP	Standard Operation Procedure
TB	Tuberculosis
UNDP	United Nations Development Program
USAID	United States Agency for International Development
WHO	World Health Organization
XDR TB	Extremely Drug Resistant Tuberculosis

Executive Summary and Recommendations

Tajikistan and Kyrgyzstan are high-burden TB-endemic countries that have made good progress to control the disease. Both confront similar strategic issues and each one has specifics related to country context.

Diagnostic performance must be improved. The inherent limitations in sputum smear microscopy necessitate moving to widespread use of fluorescent smears with LED/FM microscopes (or attachments) even at peripheral levels¹; the use of sputum culture is primarily effective in determining drug resistance patterns but is too slow, too expensive and has too many quality assurance requirements for widespread use as a diagnostic tool at even a rayon level. Thus, shifting to use of new molecular technologies for examining high priority, microscopy-smear-negative suspects is the key strategic step to improve TB diagnostics. Cepheid's GeneXpert MTB/RIF platform is the only such test currently available which also assures diagnostics of almost all TB cases, even in HIV+ persons. Currently, there are concerns relating to the GeneXpert MTB/RIF diagnostic algorithm and sputum sample transportation from peripheral microscopy laboratories to GeneXpert MTB/RIF locations, therefore appropriate mapping of the GeneXpert MTB/RIF locations and calculation of number of required cartridges should be done based on the epidemiological evidence.

Treatment performance should be improved in terms of gradually shifting from inpatient treatment to outpatient modalities. This requires strengthening of DOT and community involvement. Also, it will require rigorous use of the standard TB recording and reporting system to manage both individual patient progress and ensure rayon and overall system performance, with remedial actions being flagged quickly. In general, improved management knowledge, training opportunities, and the health system's capacity to use the appropriate TB tools have been already built in these countries and now need to be reinforced and sustained.

Drug resistance is more an indicator of past TB control program's performance rather than reflection of the current activities. The MDR-TB levels reported in each of the countries (DRS survey in both countries performed by Project HOPE/CDC in Year 2011) indicate the need for further attention and targeted actions. Although, current MDR_TB levels are of concern, it is possible to address and effectively manage the problem if appropriate actions are taken.

QHCP project teams both in Tajikistan and Kyrgyzstan are providing managerial and technical support to the countries NTPs according to the USAID approved work plans. Main achievements are summarized in "Background of project implementation in Tajikistan and Kyrgyzstan" section of the report.

Detailed analysis of the current status of the project implementation is provided in section IV of the report.

¹ FLUORESCENT LIGHT EMITTING DIODE (LED) MICROSCOPY FOR DIAGNOSIS OF TUBERCULOSIS

The detailed report on mission activities conducted in accordance with the preliminary approved SOW are presented in Annexes A-J.

Main recommendations²:

Case detection

- Actions should be taken to improve suspect detection, risk groups evaluation and contact tracing by PHC level.
- Use of new technology, such as LED microscopy and GeneXpert MTB/RIF should be supported to improve case detection and allow identifying the actual numbers of tuberculosis cases.
- Quality project technical team should provide technical support in optimization of current diagnostic steps and advocating against extensive use of X-ray at PHC level.
- Case notification amongst people over 50 years old should be analyzed because of relatively high rate of TB among children; this could be related to babysitting of children by their grandparents with TB.

Recording & Reporting

- Technical support should be provided by Quality team to improve reporting and recording system in terms of standardization and accuracy.
- New registration forms should be invented for GeneXpert MTB/RIF tests and added into standard registration system.
- Use of the standard TB recording and reporting system both for management of individual patient progress at rayon level and evaluation of overall system performance should be analyzed for better planning of actions.
- IT resources should be introduced (electronic database) for case registration and standard reporting in accordance with WHO requirements.

Treatment

- Efforts should be taken to improve and extend access to good treatment practices to the underserved segments of the population, such as migrants.
- Treatment performance should be improved in terms of outpatient modalities gradually substituting inpatient treatment of tuberculosis cases, including MDR TB and TB/HIV co-infection.

Training

- Family physician centers at the rayon level should be supported to provide continues education to family physicians, general hospital physicians, and nurses.
- Quality team should provide technical assistance to unify TB training materials. As a first step assessment of all existing materials is needed, and then the TWG need to select materials that will be used as basis for development of new training materials in Tajikistan (per NTP manager request). This process is already ongoing

² Recommendations provided for both countries unless it is specified for Tajikistan or Kyrgyzstan

Management

- Existing capacity of health system (diagnosis, registration, treatment, case management, drug management, IC) in use of appropriate TB control tools should be reinforced and sustained in both countries.
- Tajikistan, Vakhdat rayon ambulatory treatment model could be used as a basis for development of the National ambulatory treatment model.
- Data from Kyrgyzstan, Issyk Ata rayon ambulatory treatment model, should be shared with MoH authorities and new Prikaz should be issued to legalize ambulatory treatment of SS+ TB cases, including MDR TB.
- Quality team should work with the statistical departments in both countries on quality of data to be collected and submitted to WHO EURO
- Cohort analysis should be a basic tool for monitoring of TB program implementation at rayon, oblast and national levels and Quality project team should help local health providers (PHC providers, TB specialists, laboratory technicians, SES and local administration) to implement it as a regular routine management activity.

Infection Control

- FAST approach should be implemented in FPG's (Tajikistan) and FMC's (Kyrgyzstan).

Drug management

- Drug management issues came up almost at all partners meetings and technical support by Quality project is needed
- Drug management system needs strengthening and discussion at TRG is requested to decide who will take leading role in FLD/SLD estimation and procurement

ACSM & Community involvement

- Treatment support group meetings are an important tool to decrease the number of defaulters and treatment failures; these should be continued and supported by project team.
- Number of suspects referred to health system during the life of the project in the pilot territories should be analyzed to assess and plan ACSM interventions
- Public relations could be enhanced with broad involvement of the MoH Public Relations specialists in both countries.

GeneXpert MTB/RIF implementation

- Appropriate mapping of the GeneXpert MTB/RIF locations and calculation of number of cartridges should be based on epidemiological evidences.
- Proposed NTP (Tajikistan) strategy for GeneXpert MTB/RIF implementation should be revised taking into consideration current TB and MDR/TB epidemiological patterns.
- The results of GeneXpert MTB/RIF platforms implementation should be closely monitored, data and their analysis should be presented to NTPs and partner organizations for regular discussion to avoid any problems related to platforms/cartridges usage.

Coordination

- Coordination of two USAID funded projects (Quality and TB CARE I) should be strengthened through regular meetings to share information regarding ongoing activities and plan joint events, especially on the national level.
- Collaboration and coordination between PIU for GFATM funded programs and Quality project should continue to avoid duplication and synchronize all activities in overlapping territories.
- TWG's should be used as a platform for collaboration and coordination with national and international partners.

I. INTRODUCTION

Project HOPE's Senior Technical Officer provides technical leadership and guidance to staff of Tuberculosis programs implemented by Project HOPE in Europe/Eurasia and Africa regions funded by USAID, GFATM, TBREACH and other funding agencies.

The Senior Technical Officer visited CAR region several times in Y1 and Y2 of Quality project to provide on-site technical assistance for project implementation. Additionally, necessary assistance is provided on a regular basis through on-line consultations and regular calls with regional technical and country teams on development of strategies for program implementation and Y3 work plan.

The Senior Technical Officer develops and provides ongoing technical training to field staff (Regional and national) throughout the life of the project. In close cooperation with Quality Project Deputy Chief of Party and Regional Technical Director, Senior Technical Officer also communicates with Project partner organizations: MoH, NTP, USAID TB CARE I and Dialogue on HIV and TB projects, MSF, KfW, WHO, GFATM and UNDP during site visits.

The purpose of the visit is to provide the project with recommendations on implementation of the Y3 work plan activities, specifically related to pilot implementation, that are approved by the donor.

Main Objectives of the visit:

1. Work with the Project TB team to analyze the epidemiologic situation and status of implementation of planned activities in project pilot sites (Tajikistan and Kyrgyzstan).
2. Participate in a workshop organized by Quality project in Tajikistan to share experience of outpatient TB treatment and GeneXpert implementation (achievements and lessons learned) in other countries with the NTP and other partners (Annex E).
3. Facilitate a training session for Kyrgyzstan NTP and QHCP staff (20 participants) on TB epidemiology, diagnostics and treatment, internationally recognized standards and outpatient treatment modalities (Annex F).
4. Hold round table with Issyk Ata rayon TB specialists to review successes, challenges in use of Community Based Treatment Supporters (CBTS) (Annex H)
5. Meet with Project partner organizations in Tajikistan and Kyrgyzstan (MoH, NTP, USAID TB CARE I and Dialogue on HIV and TB projects, MSF, KfW, WHO, GFATM programs and UNDP) to discuss ongoing activities, coordination, and collaboration (Annexes G,H).
6. Develop recommendations for the project team on implementation of project activities and collaboration with development partners.

II. BACKGROUND OF PROJECT IMPLEMENTATION IN TAJIKISTAN AND KYRGYZSTAN

The Quality Health Care Project Tajikistan and Kyrgyzstan coordinate with the countries' NTPs, the PHC systems and TB control programs implemented by partners to increase access to high quality TB services by providing technical support to all levels of the health care system, and by providing training and supervision to increase local capacity to plan, implement, and monitor health care services for TB patients, as well as to collect, analyze and use strategic information/data for decision-making.

The Quality Health Care Project Tajikistan's trainings, supervision, and technical support to PHC providers yielded in impressive improvements in PHC physician capacity in TB diagnosis, TB case and drug management: the number of TB suspects sent to microscopy by family doctors of Dushanbe city PHC facilities increased by 14.5 % in the second project year as compared with the first year; percentage of patients who were managed by family doctors in accordance with TB diagnostic algorithm increased from 65% to 81.4% in Dushanbe, 45% to 83% in Khojand and reached 100% in Vakhdat rayon. DOT of the intensive and continuation phases has improved from 30 to 90% at the PHC facilities in Dushanbe in comparison with the first project year. The project's work on grassroots level to encourage community support for TB diagnosis and treatment resulted in improved adherence to DOT among both regular (from 85% to 88.4%) and MDR TB patients (from 92% to 94.3%) in year two of the project with decrease in the share of defaults (from 4.9% to 0%) and failures (from 22.9% to 11.4%) for 2010-2011.

Effective interventions aimed to ensure implementation of a LMIS system for SLDs helped the country to use data to allocate and dispense SLDs to avoid stock-outs, and to make correct calculations for TB drugs orders and for timing of deliveries. Due to these interventions, PHC facilities in Dushanbe show remarkable improvements in their reporting: 80% of PHC facilities of Dushanbe now sent correct LMIS reports for SLD to the national level and keep updated records as compared to 0% of facilities prior to project intervention.

The Quality Project's work to improve TB-IC has also yielded positive results, with changes being institutionalized throughout the health care system. New administrative measures have been disseminated throughout the country through use of the National TB-IC manual, which was approved in year one of the Quality Project. Now local staff in charge of TB-IC provides TA in pilot sites and had conducted 52 monitoring visits in year two using TB-IC devices supplied by the Quality Project to monitor air changes and UV lights in PHC and TB facilities.

The major activity for laboratory strengthening is implementation of QMS in the TB laboratory network. The implementation is planned in stepwise approach starting with a QMS assessment, continuing with development of training materials; QMS guidelines and training of senior laboratory staff and laboratory managers. Currently the project is starting the implementation of QMS in Sughd as a pilot oblast. Lessons learned from the pilot site will be used for development of expansion plan for countrywide implementation of QMS in TB laboratory network.

A priority in year two for the Quality Health Care Project Kyrgyzstan was to assist partners to work in accordance with international standards by shifting towards ambulatory treatment of TB, by building

drug management capacity in the country, and by updating clinical practice guidelines (CPGs). This work was linked with efforts to improve TB-IC practices in Kyrgyzstan and extensive work with community organizations in order to increase civil society participation in TB prevention and treatment efforts, and increase TB knowledge in communities.

The Quality Project launched an ambulatory pilot for outpatient treatment of sputum smear negative and non-MDR sputum smear positive TB cases. The Project prepared all levels of medical staff for the introduction of both GeneXpert and fully outpatient TB care in the Issyk Ata Rayon.

Interventions at the PHC facility level to improve the quality of care in the Sokuluk, Ak Suu and Suzak Rayons facilitated dramatic improvement in sputum collection over a one-year period, with all rayons going from under 15% of PHC health care workers collecting sputum in full compliance with the sputum monitoring sheet to over 90%, and decrease in the percentage of sputum samples that were not able to be tested due to incorrect collection techniques (blood or saliva in the sample) from 15% to 5% (Sokuluk), 43% to 8% (Ak Suu) and 38% to 18% (Suzak). The percentage of PHC health care workers who could correctly interpret the TB skin test (Mantoux) increased from 0% to 94-95% in all three rayons.

The Quality Project's efforts to improve TB-IC practices included national-level activities (by participating in development of national TB IC guidelines), as well as focusing efforts in support of the Issyk Ata pilot on improving TB IC measures at the PHC level. Activities resulted in increase of the number of PHC facilities with TB IC plans in place from 0% to 90 %, percentage of PHC facilities implementing triage and fast tracking of coughing patients from 0% to 78 % and PHC facilities with essential resources for TB IC from 0% until 84 %.

The Quality Project worked closely with the evidence-based medicine (EBM) unit to prioritize CPGs on MDR-TB, pediatric TB, general TB care at the PHC level, and TB IC. This work resulted in the development of three CPGs that have been submitted for MOH approval.

The country's drug management system was also strengthened by developing SOPs for first and second-line anti-TB drug management, improving the national LMIS Manual, training staff and providing TA to NTBC in preparation of a successful application to the GDF for a grant for pediatric TB drugs for 460 children in 2012 and to Project HOPE/GFATM to coordinate the first line anti-TB drugs supply for adults through quantification and registration. QHCP Regional drug management specialist prepared an SLD proposal and it was accepted, and also assisted to HOPE/GFATM for quantifying drug needs. These activities help guarantee TB patients uninterrupted provision of TB drugs. Through the efforts of the project pediatric TB drugs were included in the essential drug list approved by the Kyrgyzstan government in 2012. This approval ensures that regulatory authorities will not block the use of these medications as they have done with other unregistered TB drugs in the past.

Preparatory activities for implementation QMS in TB laboratory network are completed and the implementation will start in March in Talas Oblast.

III. LEADING EPIDEMIOLOGICAL ISSUES AT COUNTRY LEVEL - TAJIKISTAN AND KYRGYZSTAN

All data references are to WHO 2012 report on the TB Epidemic (Annex K).

Summary: Both high-burden, TB-endemic countries have made good progress, but confront strategic issues, each unique, but with common themes.

Diagnostic performance must be improved. The inherent limitations in sputum smear microscopy necessitate moving to widespread use of fluorescent smears with LED/FM microscopes (or attachments) even at peripheral levels; the use of sputum culture is primarily effective in determining drug resistance patterns but is too slow, too expensive and has too many quality assurance requirements for widespread use as a diagnostic tool at even a rayon level. Thus, shifting to use of new molecular technologies for examining high priority, microscopy-smear-negative suspects is the key strategic step to improve TB diagnostics. Cepheid's GeneXpert MTB/RIF platform is the only such test currently available which also assures diagnostics of almost all TB cases, even in HIV+ persons. Currently, there are concerns relating to the GeneXpert MTB/RIF diagnostic algorithm and sputum sample transportation from peripheral microscopy laboratories to GeneXpert MTB/RIF locations, therefore appropriate mapping of the GeneXpert MTB/RIF locations (transportation logistics) and calculation of number of required cartridges should be done based on the epidemiological evidence.

Treatment performance should be improved in terms of gradually shifting from inpatient treatment to outpatient modalities. This requires strengthening of DOT and community involvement. Also, it will require rigorous use of the standard TB recording and reporting system to manage both individual patient progress and ensure rayon and overall system performance, with remedial actions being flagged quickly. In general, improved management knowledge, training opportunities, and the health system's capacity to use the appropriate TB tools have been already built in these countries and now need to be reinforced and sustained.

Drug resistance is more an indicator of previous TB control program's performance rather than reflection of the current activities. The MDR-TB levels reported in each of the countries (DRS survey in both countries performed by Project HOPE/CDC in Year 2011) indicate the need for further attention and targeted actions. Although, current MDR_TB levels are of concern, it is possible to address and effectively manage the problem if appropriate actions are taken.

Tajikistan: (899 cases (new and relapses)/million population) has a relatively poor case detection rate ($CDR^3=47\%$). Closing the gap will be one primary strategic challenge, requiring emphasis on improved diagnostics (and thus use of new technologies). The ratio of new SS+ and SS- cases is 36%:36%, indicating probable under-diagnosis of SS- cases and serving as additional justification for using new diagnostic tools. Introduction of these new tools will contribute to more reliable diagnosis of real SS- cases based on evidenced based findings rather than just clinical diagnosis. This will also help eliminate over-diagnosis of SS- cases based only on clinical reasons. In time this will result in the proportion of New SS+ and SS- patients reflecting what would be expected among new patients. Unusually high

³ Case Detection Ratio (CDR) = Total new + relapse cases/ estimated incident cases.

percentage (26% of total new & relapses) of extra pulmonary cases is most probably associated with high reliance on X-ray diagnostic and is another reason to put efforts to improve diagnostic capacity.

The treatment success rate is not high enough (80%) most likely due to the high primary MDR TB. According to the DRS the primary MDR is about 13%. These figures show that both treatment and diagnostic should be improved – use of improved diagnostic tools will allow earlier diagnosis of MDR-TB and earlier treatment initiation with better results. Besides, it is important to improve and extend access to good treatment practices to the underserved segments of the population, such as migrants. Relatively high treatment success rate for retreatment cases (72%) does not correlate with DRS data (about 53% MDR TB), and should be closely monitored to ensure proper calculation of SLDs, and also research to identify why cure rates are higher than expected.

MDR-TB remains a challenge with 7.9% of cases out of total notified (604/7609). As mentioned above MDR-TB is more an indicator of past TB program performance, thus tracking the patterns in relation to current performance will help design appropriate interventions such as close monitoring and past performance of MDR-TB case management.

Reporting and recording system needs improvement in terms of standardization and accuracy. New forms of registration should be designed and implemented for GeneXpert MTB/RIF tests and added into standard registration system.

Kyrgyzstan: (1023 cases (new and relapses)/million population) has a relatively high detection rate (CDR=80%). There is a very high percentage (29% of total new & relapses) of extra pulmonary cases and it is the obvious priority requiring both better management and improved diagnostic technologies to avoid overestimation.

Treatment success rate is available for year 2009 and it is high for SS- cases (92%) and much lower 82% for SS+ new cases. Low treatment success rate for new SS+ cases could be associated with MDR TB (according to country data it is ~13% (451 MDR TB out of 3662 new pulmonary cases), weak DOT and high proportion of migrants amongst new TB cases who have limited access to treatment. Concordance in mortality and prevalence trends for the last years indicate that NTP's and partners' effort to improve situation must be sustained.

Only 60% of MDR TB cases out of all registered started treatment creating a potential risk of wide spreading of MDR TB and development of XDR TB cases. Rigorous validation of the recording and reporting system, use of better diagnostic technologies, alongside improved M&E would help address problems of MDR control resulting in significant health and economic benefits for several generations.

IV. ANALYSIS OF THE EPIDEMIOLOGIC SITUATION AND STATUS OF IMPLEMENTATION OF PLANNED ACTIVITIES IN PROJECT PILOT SITES

4.1. Tajikistan, Vakhdat rayon.

Population	290.390
Physicians	371
TB Specialists	4
Family physicians	49
Nurses	1016
Health providers	1939
Average distance to medical facility	25 km
Incidence per 100.000	87.4
Case notification/Rate per 100.000 (children <14 years old)	15/16.2
Case notification/Rate per 100.000 HIV	214/73.7
Case notification TB/HIV	6

4.1.1 Case detection

Case detection is performed in PHC facilities, the General hospital, Diagnostic centers and TB center in accordance with WHO diagnostic algorithm. Patients with cough lasting more than 3 weeks, HIV patients with TB symptoms, TB contacts and ex-prisoners are referred directly to sputum smear microscopy with registration in Register TB-15. Sputum samples are either delivered by patients themselves if they live nearby or are transported 2-3 times a week from peripheral locations by health providers.

There were 1,210 suspects examined by smear microscopy in year 2012 and 91 SS+ cases were notified (7.5%). Out of all suspects only 552 were referred by PHC (46%) and 26 (4.7%) were identified as SS+ cases (Annex A, Table 1). Actions should be taken to improve suspect's detection by PHC. It is necessary to support the Family physician center in Vakhdat rayon to provide continuous education for family physicians, general hospital physicians, and nurses.

National CDR is 47% (~89.9 incidence) and Vakhdat rayon incidence is close to the national average (87.4). The National trend in case notification for period of 2009-2011 (6,125-6,290 new & relapses) shows that CDR is probably underestimated and the case notification rate in Vakhdat rayon is close to actual numbers. In total, There were 254 tuberculosis patients registered in year 2012 (Annex A, Table 2).

As it was stated above, use of new technology, such as LED microscopy and GeneXpert MTB/RIF could improve case detection and identify the actual numbers of tuberculosis cases.

4.1.2. Treatment modalities

Official outpatient treatment pilot is established since 2011 based on strategy of ambulatory treatment developed by the QHCP team. However, in reality outpatient treatment started in year 2010 and transfer to ambulatory treatment was smooth enough - poor quality of services in hospitals (including conditions of the hospital itself) resulted in a situation when patients preferred outpatient treatment. After being diagnosed and registered TB patients have several options to get treatment. Family physician and TB specialist explain the patient that he/she can be treated at TB hospital or on ambulatory basis, the patient signs an informed consent form and after that has a choice to get DOT at a PHC facility, by a relative, or from a volunteer.

Since 2011 a comprehensive strategy (model) of ambulatory treatment has been developed and implemented, including: internationally recognized standards for diagnosis and treatment, WHO recommended recording and reporting forms, monitoring system, training for health providers, community involvement, and social support.

The ambulatory treatment model has been successfully applied for new and retreatment cases including MDR TB patients.

There were more than 400 patients treated on an outpatient basis in three years in Vakhdat rayon (Annex A, Table 3). Treatment success rate of ambulatory patients (Annex A, Table 4 and 5) was 88% (2010) and 86% (2011) in comparison with inpatient treatment success rates of 75% and 71%, respectively. However, this comparison is not really correct way of measuring success because complicated and severe cases of disease were definitely treated in hospitals.

Comprehensive and more detailed analysis of treatment results in both categories of patients is recommended.

4.1.3. Recording and Reporting

There are several different forms used for patient's registration and reporting, and all forms follow the WHO standards, however, use of these forms should be improved as it is indicated below.

There are several issues that should be addressed: family physicians must record if suspects have had contact with TB patients in the past and if suspect received TB treatment in the past; all patients should be registered in TB 015. Ideally, family nurses should assess and register all patients with cough before physician sees them.

4.1.4. Drug management

Rayon TB coordinator gets TB drugs from central warehouse where a 3 month buffer stock of FLD and SLD is available. Rayon TB specialist informs family physicians regarding new TB cases and provides TB drugs for outpatient patients. Rayon drug manager controls drug stocks at all rural health centers where TB patients get ambulatory treatment.

The GFATM recently discontinued support for drug distribution from central to rayon level, and the NTP program does not have capacity to assume this responsibility. There are also issues with oblast

drug managers (lack of training, high turnover of staff), situation with SLD is worse than with FLDs, because SLD management system is more complex.

4.1.5. Laboratory diagnostic

There is one TB laboratory based in the local Vakhdat TB center which has been equipped with support of Quality project. All necessary recording and reporting forms are in place (TB 04, lab register for consumables, etc.). Data analysis shows that laboratory functions adequately and meets WHO requirements: SS+ cases have been detected at 7.1% and 7.5% in 2011 and 2012, respectively, out of all suspects (Annex A, Table 6); percentage of saliva in sputum is low (0.6% in 2011 and 1.5% in 2012); there were zero false positive and false negative results in 2012 based on EQA results. Major concern relates to PHC performance and connection to the microscopy laboratory. As it is noted above, in 2011 only 572 suspects out of 1,301 were referred for microscope by PHC. In 2012 the figure is almost the same (552/1210). The latter was discussed during workshop and recommendations to improve PHC performance have been provided thus, it is important to maintain good connection between PHC and laboratory and at the same time make sure that laboratory can support adequate workload.

Renovation of the laboratory is needed, increased workload will be possible if additional technician will be hired, and electrical generator will be provided to avoid frequent interruption of work due to electricity cut off.

4.1.6. Infection control, side effects management and social support in pilot territory

Infection control activities in the pilot site for ambulatory treatment are mostly related to educating and training TB patients and their family members in simple infection control measures that could be easily implemented at home. Taking into consideration that about 7% (all SS+ and SS-) out of new TB cases are children under 14 years old, the recommendation was given to the Quality team to pay attention to case notification amongst people over 50 years of age because relatively high rate of TB among children could be related to babysitting of children by their grandparents with TB. TB incidence in age group > 55 year olds even higher than in 25-34 year olds age group (Table A).

Table A. TB Incidence by age

	Age						
	0-14	15-24	25-34	35-44	45-54	55-64	65+
Population	2635052	1702120	1152411	837505	636603	279735	285603
SS+ cases	35	718	638	325	238	180	156
per 100000	1.3	42.2	55.4	38.8	37.4	64.3	54.6

There were no severe side effects among TB patients on ambulatory treatment, and all patients were educated prior to starting treatment.

With support of Quality project TB support groups are functioning. These are based in regional TB center and in jamoats. New TB patients are invited to participate in group gatherings where they get psychological support from their peers sick with TB or former patients, especially from those who experienced adverse reactions of TB drugs and can share experience.

Volunteers worked in 11 jamoats during 9 months of 2011; they had meetings with the population informing and educating people about TB symptoms, Volunteers referred 96 TB suspects to health centers, out of these 11 patients with TB were identified.

4.1.7. Comments on GeneXpert MTB/RIF implementation strategy introduced by TB CARE I

Several discussions took place with national and international partners regarding strategy of GeneXpert MTB/RIF implementation developed by TB CARE I team. After the draft document was shared with Quality team, it was discussed with Regional Laboratory Advisor, Dr. Marija Joncevska and comments were provided back to TB CARE I team, national and international partners (Annex C).

4.2. Kyrgyzstan Pilot, Issyk Ata rayon

Population	138 400
TB Specialists	2
Family physicians	54
Nurses	102
Health providers	126
Average distance to medical facility	35km
Incidence 100.000	119.9
Case notification/Rate per 100.000 (children <14 years old)	14/10.1
Case notification/Rate per 100.000 HIV	101/
Case notification TB/HIV	2

4.2.1. Case detection

Case detection is performed by PHC facilities, Rayon hospitals, and Family Medicine center in accordance with WHO diagnostic algorithm. Patients with cough more than 3 weeks, HIV patients with TB symptoms, TB contacts, and ex-prisoners are referred directly to sputum smear microscopy at the laboratory of Family Medicine Center. There were 405 suspects examined by smear microscopy in Issyk Ata rayon (2012). There were 156 total TB cases registered (new and relapses), 28 SS+ (18%), 71 SS- (46%), 42 EP (27%) and 15 relapse (10%) cases (Annex B, Tables 7 and 9). Relatively high number of EP cases could be explained by over diagnosis, and GeneXpert MTB/RIF data below (Annex B, Table 11) supports this assumption based on previously treated cases (only 39% previously treated cases were confirmed). Also it could be wide presence of *M. bovis*. Limited diagnostic capabilities also could contribute to incorrect tuberculosis diagnosis. There is no ID of culture at local laboratories, so it could be either *M. bovis* or micobacterial infection. Incidence in Issyk Ata rayon is 116 per 100,000 and the national incidence rate is 102 per 100,000. Therefore, efforts should be taken for suspect identification, risk groups evaluation and contact tracing.

LED microscopy could improve case detection and GeneXpert MTB/RIF should be continued. High sensitivity and specificity of GeneXpert MTB/RIF will help to eliminate non M. tuberculosis cases and reduce the number of unnecessary TB treatment.

4.2.2. Treatment modalities

Officially the outpatient treatment pilot started in April of 2012 based on MoH prikaz # 160 issued on 04.04.2012.

Issyk Ata rayon is similar to Vakhdat rayon in Tajikistan; TB patients have several options to continue treatment after being diagnosed and registered as a TB case. Family physicians and TB specialists explain to the patient that he/she can be treated in TB hospital or on an ambulatory basis. After signing an informed consent form TB patients have a choice to get DOT at PHC facility.

The ambulatory treatment model has been successfully applied for the majority of new smear negative cases and a few new smear positive and retreatment cases.

There were 166 (new, relapses, EP and retreatment) TB patients registered in 2012 and 78 of them were enrolled to treatment on outpatient basis.

It is too early to evaluate treatment outcomes for patients on ambulatory treatment but it is worth mentioning that only one patient stopped treatment because of moving to another place. At the same time in 2011 treatment success rate increased by almost 8%, default rate decreased from 7.7% in 2010 to 4.9% in 2011, and the failure rate decreased from 13.2% to 9.8% (Annex B, Table 8).

4.2.3. Recording and Reporting

Most of reporting and recording forms are in line with WHO recommendations. However, there are some issues that should be addressed:

- Not all recording and reporting forms are approved by MoH;
- TB 06 form should be improved to address the current situation with TB in the country;
- TB 09 should be always used for “transferred out” category of patients;
- “Chronic” category is still in place but there is no formal recording of those patients;
- TB patients who did not start the treatment for any reason should still be registered;
- New electronic data base should be implemented.

4.2.4. Drug management

The drug management system is similar to Tajikistan. FLD and SLD were provided by the GFATM and issues on the oblast and rayon levels are the same. All the gaps mostly relate to the lack of trained personnel, and especially when it concerns to SLD management. Some calculations of SLD needs have been done by different experts in the past but there is no robust MDR TB data, and calculation varies from 800 to 1200 SLD treatment regimens per year.

According to the country data (Annex K), there are ~5,500 new and relapse cases, and 700 retreatment TB cases(2011). Taking into account primary MDR TB is ~13%, and 35% among retreatment cases⁴ ~ 700 new MDR TB cases per year could be expected plus ~300 retreatment MDR TB cases according to this estimation there currently are ~1,000 MDR TB cases per year Drug management system is a complex and complicated issue and support by project drug management specialist is absolutely needed.

4.2.5. Laboratory diagnostic

There is one TB laboratory based at FMC which was renovated and equipped with support of Quality project. GeneXpert MTB/RIF platform (provided within the framework of the program) started functioning in October 2012.

All necessary recording and reporting forms are in place (TB 04, lab register for consumables, etc.). Data analysis shows that laboratory functions adequately and meets WHO requirements. Detection of SS+ cases is relatively low (28%) (Annex B, Chart 1), but there is a positive tendency (in quarterly data) in SS+ detection over the 2012. Less than 20% of SS+ were detected in Q1 and up to 28% in Q4. This tendency is note to coincide with the introduction of GeneXpert and was anticipated as Xpert introduction should help improve the quality of TB diagnosis.

In addition, to the work done in Issyk Ata preparatory activities for implementation of QMS in the TB laboratory network are completed and the implementation will start in March in Talas Oblast. This is a major initiative that will affect the entire laboratory network.

4.2.6. Infection control

FAST (Find Active Separate and Treat) approach was implemented in FPGs, patients with cough were isolated, referred to physician directly and served as priority, thus shortening the time for patients to be in the facility. At the family center patients were questioned regarding TB symptoms, and if suspected, immediately referred to the nurse for sputum collection and sputum smear microscopy exam.

Infection control activities in the pilot site for ambulatory treatment are similar to Tajikistan and in Y3, mostly relate to educating and training of TB patients and their family members in basic infection control measures that could be easily implemented at home.

4.2.7. Community and social support

Several activities on information and education were conducted with Village health committee members.

Quality Project supports activities of two Treatment support groups in Family Medicine Center. New patients are invited to the meetings where patients receive psychological support from medical workers and ex-patients who share personal experience about issues faced during the treatment and ways to overcome these. Social support is also provided. Food parcels are distributed to TB patients on continuation phase within the framework of GFATM funded program implemented by Project HOPE.

⁴ % of new & retreatment MDR TB was taken from Issyk Ata GeneXpert MTB/RIF tests, based on ~ 300 tests with some adjustments

4.2.8. GeneXpert MTB/RIF implementation

Results of GeneXpert MTB/RIF tests are presented in Annex B, Table 11. In total 257 tests were performed for new and previously treated suspects for period of October 2012-February 2013. There were 15% GeneXpert MTB+/RIF (10% GeneXpert MTB+/**RIF+**) results for new suspects and 39% GeneXpert MTB+/RIF (35% GeneXpert MTB+/**RIF+**) results for previously treated cases. Two important observations should be stressed: first - primary resistance to RIF is ~ 10%, and second - tuberculosis was confirmed only in 39% previously treated cases. These numbers indicate that the “real” number of tuberculosis cases among previously treated is overestimated and true prevalence is much less as noted in many earlier reports of the sub-contractor. Therefore, it is important to continue GeneXpert MTB/RIF testing and analyze results.

Per QHCP Kyrgyzstan manager request technical assistance was provided to estimate the numbers of GeneXpert MTB/RIF tests needed in the expand Xpert coverage area approved by USAID based on available data (Annex B, Tables 10,10A). GeneXpert MTB/RIF platform is available in Chu oblast TB dispenser and operates under TB REACH project. Therefore, numbers of GeneXpert MTB/RIF tests were estimated for two case scenarios with and without Chui OTBD data; there are ~900/500 tests, respectively.

Annexes

Annex A: Tajikistan, Vakhdat rayon data set

Table 1: New TB cases referred and detected by PHC facilities in Vakhdat rayonYear	All detected cases	Detected SS+ cases	
		Abs	%
2007	391	14	3.6
2008	420	11	2.6
2009	693	24	3.5
2010	550	22	4
2011	572	17	3
2012	552	26	4.7

Table 2: TB notification in Vakhdat rayon

Year	New SS +	New SS -	EP	Total new cases	Retreatment	Total
2007	94	90	119	303	143	446
2008	74	67	77	218	77	295
2009	73	67	77	217	45	262
2010	95	63	69	227	46	273
2011	74	68	58	200	41	241
2012	71	69	76	216	38	254

Table 3: Patient treated in outpatient settings in Vakhdat rayon

Year	New patients						Previously treated		Total
	New SS+		New SS-		Total				
	Abs	%	Abs	%	Abs	%	Abs	%	
2010	33	25	97	75	130	84	24	15	154
2011	28	22	97	77	125	89	16	11	141
2012	28	25	86	77	114	84	22	16	136

Table 4: Treatment outcomes in Vakhdat rayon, 2010

	Total #		Treatment success		Died		Failed		Defaulted	
	abs	%	abs	%	abs	%	abs	%	abs	%
Outpatient	154	56%	136	88%	7	5%	9	6%	2	1.20%
In patient	119	44%	89	75%	11	9%	16	13%	2	1.60%

Table 5: Treatment outcomes in Vakhdat rayon, 2011

	Total #		Treatment success		Died		Failed		Defaulted	
	abs	%	abs	%	abs	%	abs	%	abs	%
Outpatient	145	60%	125	86%	4	3%	11	8%	5	3. %
In patient	96	40%	68	71%	10	11%	14	15%	2	2.1%

Table 6: The number of SS+ cases amongst TB suspects in Vakhdat Rayon

Year	Diagnostics	New cases SS+	
		Abs	%
2010	1241	141	11,4
2011	1301	92	7,1
2012	1210	91	7,5

Annex B: Kyrgyzstan, Issyk Ata rayon data set

Table 7: TB notification in Issyk Ata rayon

Year	New SS +	New SS -	EP	Total new cases	Relapses	Total
2010	52	71	29	142	15	167
2011	41	68	23	132	11	143
2012	28	71	42	141	15	156

Chart 1: Proportion of new pulmonary SS+ and SS- cases, 2012

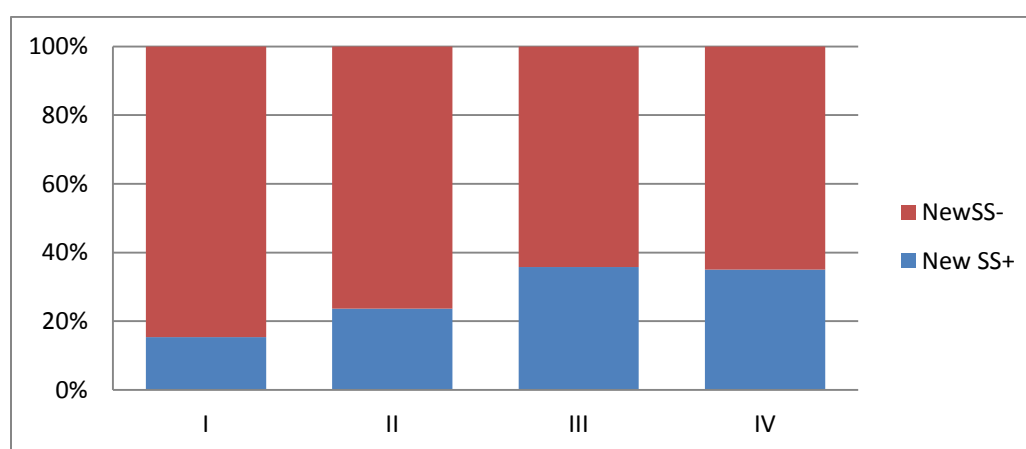


Table 8: Treatment outcomes New SS+ cases, 2010 – 2011

Year	Treatment success		Died		Failed		Defaulted		Transferred		Total	
	abs	%	abs	%	abs	%	abs	%	abs	%	abs	%
2010	38	73	2	3.8	7	13	4	8	1	1.9	52	100
2011	33	81	1	2.4	4	9.8	2	5	1	2.4	41	100

Table 9: Epidemiological data for 2012

Rayons	Population	Diagnostic microscopy	New SS+	New SS-	Relapses
Alamedin	148700	1298	42	92	4
Chui r-n	47300	123	24	35	0
Kemin	44100	135	12	37	8
Tokmak city	53400	181	13	57	7

Issyk Ata	132000	405	28	71	15
Total	425500	2142	119	292	34

Table 10: Estimated consumption of cartridges for February 15- June 30, 2013

Rayons	Total for February 15-June 30, 2013	Estimated invalid tests (10%)	Estimated total number of cartridges
Alamedin+Chui OTBD	488	49	537
Chui r-n	46	5	51
Kemin	53	5	59
Tokmak city	70	7	77
Issyk Ata	157	16	173
Total	815	81	896

Table 10 A: Estimated cart. consumption for February 15- June 30, 2013 w/o Chui OTBD data Rayons	Total for February 15-June 30, 2013	Estimated invalid tests (10%)	Estimated total number of cartridges with invalid tests
Alamedin (only)	99	10	109
Chui r-n	46	5	51
Kemin	53	5	59
Tokmak city	70	7	77
Issyk Ata	157	16	173
Total	426	43	468

Table 11: The results of GeneXpert in Issyk Ata rayon

	October	November	December	TOTAL	January	February	Grand TOTAL	
				2012	2013	2013	abs	%
Total	10	58	30	98	40	119	257	100
New case suspect	9	40	20	69	30	99	198	77
Previously treated suspect	1	18	10	29	10	20	59	23
MTB-	7	33	20	60	29	85	174	68
MTB+	3	11	8	22	7	23	52	20
New case	2	3	5	10	4	15	29	15
Previously treated	1	8	3	12	3	8	23	39
MTB+/RIF+	1	2	2	5	1	5	11	21
New case	0	0	0	0	0	3	3	10
Previously treated	1	2	2	5	1	2	8	35
MTB+/RIF-	2	8	6	16	6	18	40	77
MTB+/RIF uncertain		1		1		0	1	2
Invalid result		4		4		2	6	2
Mistake		10	2	12	4	11	27	11

Annex C: TB CARE I GeneXpert Implementation Strategy for Tajikistan

Comments and recommendations

1. As stated in the document the Xpert platforms are currently used without any specific strategy or pre selection of patients by priority, but the effectiveness is significant, especially in detecting MDR which was found in 41% of confirmed TB cases (from 30% - 43%). This fact should be taken into account by the NTP if the program aims to detect more TB and MDR TB cases and improve the low case detection rate (44% by WHO estimation).
2. There are some unclear points concerning the defined priority groups for testing. The number of new patients who had been in contact with MDR TB would be very low, as the capacity to confirm MDR is insufficient. This may lead to significant reduction of number of tested patients and underdiagnose MDR in new TB cases. Taking into account the high MDR TB rate in new cases, all new cases can be considered as a priority group. Xpert MTB/Rif can increase the number of confirmed TB and MDR TB among smear negative cases as well, and in a country with serious MDR problem, this should be seriously taken into account. The effectiveness of Xpert MTB/Rif in detection of TB and MDR TB among smear negative cases has been well documented in the systematic review of data from different settings, conducted by the group of experts (Steingart KR, Sohn H, Schiller I, Kloda LA, Boehme CC, Pai M, Dendukuri N. Xpert® MTB/RIF assay for pulmonary tuberculosis and rifampicin resistance in adults. *Cochrane Database of Systematic Reviews* 2013, Issue 1. Art. No.: CD009593. DOI:10.1002/14651858.CD009593.pub2.).
3. There are some contradictions concerning the testing of patients who do not have access to culture diagnosis. On one hand they are recommended for Xpert testing, but on another the strategy recommends Xpert testing only if culture examination can be ensured. This needs clarification, when is culture examination necessary in regards to selection of patients for testing? Currently, the transportation of samples for culture and DST is available only for patients from MDR pilot projects.
4. There is no estimation of the workload per machine and per available of cartridges in particular sites. Limitations for testing may be related to the shortage of second line drugs, but it has to be clearly stated in the strategy and justified, presenting gradual increase of testing as the access to treatment improves.
5. The monitoring of implementation process is mentioned in the strategy, but monitoring tools (checklists) and the source of information (Xpert registers) are not included. They should be a part of the strategy in order to enable proper data collection and analysis.

Recommendation: Proposed strategy for GeneXpert MTB/RIF implementation should be revised taking into consideration the current TB situation in Tajikistan

Annex D: Meetings in Almaty

1. QHCP. Meeting with CoP David Elkins, Deputy CoP Tom Mohr, Regional TB Adviser Dr. Tsogt and Regional Technical Director Bakhtiyar Babamuradov.

- Debriefing meeting before the visit
- Discussion of the details of SOW

2. Meeting with TB CARE I: S. Pak, Regional Senior TB Consultant, M. Idrisova, Senior Regional TB Adviser, A. Tursunbaeva, Regional M&E Officer, T. Pushkina, Project coordinator. From QHCP: T. Mohr, Deputy CoP, Dr. Tsogt, Regional TB Advisor and Br. Babamuradov, Regional Technical Director.

Coordination between two projects has been discussed. It was agreed to coordinate WP's in following activities:

- On countries level make a joint plan for similar activities in both WPs;
- ACSM. Coordinate World TB Day activities;
- Exchange information on GeneXpert MTB/RIF implementation;
- QHCP technical team will provide comments on GeneXpert MTB/RIF strategy for CAR;
- QHCP Tajikistan team will participate in 2 days MDR TB training;
- Coordinate activities in participation in "CVKK" (Tajikistan);
- Standard SOP package will be jointly created
- Universal M&E tool will be developed

Annex E: Workshop in Tajikistan

Participate in a workshop organized by Quality project in Tajikistan to share experience of outpatient TB treatment and GeneXpert implementation (achievements and lessons learned) in other countries with the NTP and other partners

Workshop on results of out-patient treatment with community involvement in Vakhdat rayon took place in Dushanbe hotel “Istiqlol” on February 4, 2013 with participants from NTP, local partners from Vakhdat and Dushanbe and international organizations. The goal was to discuss results of ambulatory treatment of TB/MDR TB patients in Vakhdat and ways of increasing community role.

Agenda for the workshop included:

1. Introduction.
2. Ambulatory TB and MDRTB treatment in Tajikistan- Safarova Z., National MDR TB coordinator.
3. General PHC characteristics of Vakhdat rayon- Mr. Kurbanov V., Deputy PHC manager of Vakhdat.
4. TB epidemiology of Vakhdat for the last 3-4 years and results of ambulatory treatment- Islomov A., TB director of rayon TB dispensary
5. Work of Vakhdat laboratory: strengths and weaknesses, recommendations- Baidulloeva Zamira, QHCP Laboratory Specialist
6. Social situation of Vakhdat: characteristics and results of work with volunteers and TB patients- Gairatshoeva F., Head of rayon Healthy Life Style Center of Vakhdat .
7. Lessons learned-Adilbekova R., TB Director of USAID/Quality Health Care project.

Main points of discussion and conclusions:

1. Case detection by PHC should be strengthened
2. Contact tracing by PHC should be improved. Stigma is a big problem amongst TB patients and general population, therefore educational sessions should be an essential part of TB program
3. Priority groups for TB screening are people with: HIV, Diabetes Mellitus, Heart Diseases, Anemia
4. There is a need for trainings for family physicians, physicians of general hospitals and nurses
5. Ambulatory treatment results for sensitive and MDR TB cases in Vakhdat rayon are good. Treatment results for sensitive TB patients are above the national (~88.3% in 2010; 86.2% in 2011), and treatment success rate for MDR TB patients is in concordance with WHO average data (~56%).
6. National MDR TB guidelines have been approved by MoH, trainings should be conducted for physicians and nurses
7. TB laboratory performance is adequate to program requirements, however there are some problems related to sputum collection (saliva), renovation of the laboratory, need to hire additional technicians to handle workload.
8. Volunteers performed very well identifying suspects (11 TB cases were identified out 96 suspects), and it is important to support their participation in TB program implementation

Recommendation:

Vakhdat ambulatory treatment model should be used as a basis for the National ambulatory treatment model, especially based on very successful involvement of CBO's.

Annex F: Training session in Kyrgyzstan

Facilitate a training session for Kyrgyzstan NTP and QHCP staff (20 staff) on TB epidemiology, diagnostics and treatment internationally recognized standards and outpatient treatment modalities

Training program was facilitated and there were several specific issues discussed (training program agenda for 3 days training could be provided per request):

- I. International standards for diagnostics and treatment (presentation could be provided by request).

Specific topics of cohort analysis implication for TB program have been discussed. It was underlined that all elements of TB program should be standardized and linked to each other. For example, if TB program could detect 70% of all TB cases (CDR=70%), it means that 70 new patients were founded out of 100 that have tuberculosis now, and if 85% out of them were successfully treated, it means that only ~59% of new tuberculosis cases were treated successfully, so 41 patients with SS+ still are in the community and spreading tuberculosis germs. If those 41 SS+ patients infect ~ 410 new people, out of those 410 new infected people ~ 40 people can develop TB in upcoming five years.

Recommendations:

Cohort analysis should be a basic tool for monitoring of TB program implementation at rayon, oblast and national levels and Quality project team should help local health providers (primary health care, TB specialists, Laboratory technicians and SES) to implement it in the routine manner and on regular basis.

2. Managerial aspects of GeneXpert MTB/RIF implementation

Several main topics have been discussed:

- Procurement of GeneXpert MTB/RIF;
- GeneXpert MTB/RIF mapping;
- Cartridge needs calculation;
- Sputum sample transportation system;
- Training of lab technicians;
- Most common mistakes in GeneXpert MTB/RIF implementation;
- Diagnostic algorithm according to different MDR TB and HIV settings.

There are several GeneXpert MTB/RIF platforms in the country implemented by different organizations, such as Quality/USAID, TB REACH and MSF. It was mentioned that almost 8,000 cartridges (TB REACH) have expiration date on May 2013 and it is obvious that these will not be fully utilized by the national program. This situation happened due to different reasons (which are out of scope of this report) but it clearly indicates that coordination of all the activities related to GeneXpert MTB/RIF implementation on the national level is a must.

Recommendation:

The results of GeneXpert MTB/RIF platforms implementation should be closely monitored and presented to NTP and partner organizations for regular discussion

3. Ambulatory vs. inpatient treatment of the TB patients from the following main points:

- Convenience for the patients;
- Epidemiology of tuberculosis;
- Management of TB cases (diagnostics, treatment, drug management, side effects of treatment, integration of TB/PHC/SES services, health care providers training, patients education);
- Financial aspects of out/inpatient treatment;
- Infection control;
- Community involvement

Participating SES specialists shared their concerns regarding legal basis (MoH prikaz for ambulatory treatment of S-/S+ cases).

Recommendation:

The results of ambulatory treatment in pilot territory should be shared with MoH authorities and new Prikaz should be issued to legalize ambulatory treatment of SS-/SS+ TB cases including MDR TB.

Annex G: Meetings in Tajikistan

Meet with Project team and partner organizations to discuss ongoing activities, coordination, and collaboration.

1. Meeting with TJK Quality Project team: the country manager, deputy country manager, TB Director, Laboratory and CAH coordinators, discussing the Y3 plan, the project vision, achievements, and problems creating barriers to implementation of the project.

The quality of data reported by local managers should be improved. For example, the total number of registered cases and treatment outcomes do not match (Dushanbe 128/110, Sogt 513/426, Vakhdat 74/52). Several possible reasons behind this issue were discussed with the project technical team and should be closely monitored.

Project Regional Technical Director will share the form for drug consumption where all patients should sign during DOT.

It was agreed that inclusion of drug management in the Project WP for Year 3 is really crucial.

Cohort analysis should be a part of routine monitoring activities.

QMS will be implemented following training provided by the Regional laboratory specialist(s) in December 2012. Two lab technicians got MDR TB in Macheton hospital, so IC measures should be implemented as a part of QMS as soon as possible. Also, SOP's for laboratories will be implemented. Quality of sputum samples still remains an issue: in Sughd oblast saliva up to 9% in policlinics and 16.5% in city laboratory.

Recommendations

- **Data quality should be checked during monitoring visits with local PHC managers and TB specialists**
- **Epidemiological data (cohort analysis) should be a basic point for discussion with PHC managers and TB specialists as well as with heads of Hokumats and jamoats**

2. Meeting with Dr. Oktam Bobohadjaev, NTP Manager

The meeting was held at the RCBT with participation of R. Adilbekova, Quality Project TB Director and M. Mahmudova, TBCARE I Country manager. Dr. Bobohadjaev pointed out the need for close collaboration between all partners and good coordination of activities to strengthen National TB program.

Dr. Bobohadjaev asked for assistance in unification of TB training materials for the country. Also Dr. Bobohadjaev recommended to include PAL strategy in Quality training curriculum for TB.

Recommendations

- **Analyze results of GeneXpert implementation in UNDP pilots to finalize instruction for GeneExpert implementation work with the statistical department on quality of data to be collected and submitted to WHO EURO**
- **Quality team will provide technical assistance to unify TB training materials, as a first step assessment of all existing materials should be done, then TWG need to select materials to be used as a basis for development of new materials.**

3. Meeting with Dr. Makhmudova, Tajikistan Country Manager, TBCARE I

Discussion covered collaboration on implementation of the National TB program as well as coordination of ongoing activities of Quality Project with TBCAR I .

Dr. Makhmudova presented current and planned TB CARE I activities, and it was agreed that she will share TB CARE I work plan with Quality team.

It was also agreed to have better coordination between USAID projects and share materials related the projects' implementation and plans.

Current situation with procurement of SLDs were discussed, and Dr. Makhmudova shared her concerns regarding lack of communication between partners. TWG is the best forum for information sharing and should be used better. It was agreed to discuss the SLD issue and GeneXpert implementation issues during joint meeting with NTP manager Dr. Bobohodjaev.

Recommendations

To improve coordination between two USAID funded projects having regular meetings, sharing information about ongoing activities and plan joint events, especially on national level.

4. Meeting with Dr. Z. Maksumova, TB manager of UNDP GFATM grant

Again collaboration in implementation of the National TB program and coordination of ongoing activities was discussed.

Dr. Maksumova presented current situation with UNDP GFATM grant implementation and informed about major cut of activities from workplan to have more funds for SLD procurement. \$4.0 ml is planned to spend for SLD and \$1.2 ml for laboratory consumables in next two years.

Laboratory component is essential for both UNDP GFATM grant and Quality projects, so it was agreed that Quality laboratory specialist will participate in laboratory consumables calculation.

Reasonable approach for separation of management, procurement and technical support under laboratory component was also discussed.

It was noted that in the current situation UNDP will decrease support for drug transportation and drug management activities. There is already a big demand for qualified drug managers in the country; in

some oblasts it is even impossible to find people who can be trained. Therefore, it is really important to continue support of drug management activities by Quality project.

Recommendations

Drug management issues were raised by partners during almost all partners meetings, emphasizing the importance for Quality project to support this component.

5. Meeting with Dr. T. Aptekar, GFATM Project Manager, Project HOPE

Programs coordinate activities already but more should be done. It was agreed to share materials related the projects' implementation and plans but also to find opportunities for one program to support another one particularly because GFATM funds for activities were cut to increase funding for procurement. For example, Quality project will provide trainings on pilot sites of GFATM funded program.

Recommendations

Continue to strengthen collaboration and coordination between GFATM and Quality projects to fill gaps and provide better support for National TB program.

6. Meeting with Dr. Sh. Cholov, Manager of City Health Center of Vakhdat rayon and Dr. V. Kurbanov at Vakhdat City Health Center

Points for discussion:

1. Current structure of health care system in Vakhdat rayon;
2. Identification of TB suspects;
3. Diagnostic algorithm for TB;
4. Role of PHC and general hospital physicians in TB cases detection;
5. Monitoring of PHC activities in diagnostic and treatment of TB cases;
6. Coordination between PHC and TB services.

Several issues were identified during discussion, such as: PHC identified only ~50% TB suspects; PHC physicians over relying on X ray, there were > 7,000 X rays in 2012 but there is no data how many TB cases were identified; also there is no financial data how much the wide use of X ray costs to health system; there is a big demand for trainings for physicians and nurses who recently started to work; monitoring activities should be technically and financially supported by Quality project; coordination between PHC and TB services exists but needs improvement.

Recommendations:

Thorough analysis of all aspects of TB program implementation in Vakhdat rayon should be done, which could serve as a basis for development of the strategy for NTP.

7. Visit to polyclinic #2 in Dushanbe city.

Participated in Treatment support group's meeting with 14 patients and their family members. At the meeting food parcels provided by GFATM were distributed among patients. Also, the meeting with TB specialist took place, and following points have been discussed: diagnostic algorithm, risk groups for tuberculosis and treatment modalities. It is agreed that "old soviet" diagnostic system with extensive use of fluorography is expensive and has low effectiveness. There were 18,000 fluorography tests performed in 2012, and only 7 cases of TB were identified, which is only 0.04%.

Recommendations

- **Treatment support group meetings are important to decrease the number of defaulters and treatment failures; this activity should be continued by project team.**
- **Technical support from Quality project technical team is needed for optimization of current diagnostic approach at PHC level**

8. Joint meeting with Jeff Leimarre, Expand TB project, Rayan Hose Ruiz, M. Karimov (UNDP GFATM PIU), and NTP Manager Dr Bobohodjaev.

Jeff Leimarre asked to have a short meeting with partners to discuss plan of GeneXpert implementation in Tajikistan at the end of the workshop. He presented cartridge calculation based on three scenarios of GeneXpert implementation and these were discussed by partners.

Recommendations

Revise draft strategy for GeneXpert MTB/RIF implementation developed by National TWG in Tajikistan

9. Meeting with M. Sheridan, Country manager, QHCP

Purpose: Debriefing with trip result findings and preliminary recommendations.

Acknowledgements were provided to Tajikistan Quality team in organizing and supporting all activities during the visit. Trip activities were well and wisely prepared that allowed to accomplish all planned activities as stated in the SOW.

10. Meeting with Dilorom Kasimova USAID health officer

Purpose: Debrief with preliminary trip results.

USAID Country Officer was debriefed regarding main observations during trip, partners meetings and main topics of discussions.

Annex H: Meetings in Kyrgyzstan

1. Meeting with Dr. Imanliev, M&E department of National TB Center: Main issue raised by Dr. Imanaliev related to assistance with utilization of GeneXpert cartridges from TBREACH project. About 8,000 cartridges will expire in May 2013 and it is clear that those could not be utilized before expiration date. Another important discussion was about current drug management system. Dr. Imanaliev mentioned that FLD system is not so complicated as SLD system due to different issues such as the number of drugs, side effects, duration of treatment etc. He stated that it is really important to continue support of drug management system in Kyrgyzstan because country's technical capacity is limited. The legislative base guiding SES is outdated and does not support ambulatory treatment.

Finally Dr. Imanaliev pointed out that there is a need for close collaboration between all partners and good coordination of activities to strengthening National TB program; TB REACH implementation is a good example to demonstrate how important the coordination is.

Recommendations

- **Technical assistance by Quality Project is needed to support drug management system in Kyrgyzstan.**
- **Legal basis for ambulatory treatment modalities is needed and issue should be discussed with the NTP and MoH.**

2. Meeting with B. Myrzaliev country manager and R. Mazitov technical officer, Kyrgyzstan, TB CARE I

It was agreed to have strengthen collaboration between USAID projects to ensure good coordination of activities, share materials related the projects' implementation and plans. TB CARE project is planning to establish ambulatory pilot in Bishkek city, so it was agreed that TB CARE will use all materials related to outpatient pilot developed by Quality project, Quality project experience with family group physicians. Also, TB CARE project does not have activities related to drug management system and ACSM, and importance of continuing drug management activities by Quality project was discussed. Laboratory network system will be strengthened by both projects and QMS implementation will be coordinated, also SOP's will be developed jointly.

Recommendations

Regular meetings should be set between two projects for WP coordination

3. Meeting with Svetlana Asankhodjaeva (QHCP) ACSM specialist

Meeting aimed to discuss ongoing activities of ACSM component of the Quality program and current collaboration with other programs in the country.

The National strategy has been developed on the country level, and final draft is ready for comments from the partners and submission for MoH approval. TB World Day activities have been discussed and coordinated in thematic working group with other partners (MSF, Project HOPE, TB REACH, UNDP, WHO, IFRC and Swiss Red Cross) and Quality program took a lead in this.

Population information campaign was organized jointly with the Republican Center of Healthy Life Style and also through rural health centers. Community based treatment supporters groups are working on the peripheral level.

Recommendations

- **ACSM is an important component of the TB program implementation and it would be very useful to check and analyze the number of suspects referred to health system during the life of the project;**
- **Public relations could be enhanced with broad involvement of the MoH public relations specialist.**

4. Meeting with UNDP representative Irina Schelokova, Coordinator GFATM for TB.

Meeting aimed to discuss coordination between Quality program and GFATM UNDP program. UNDP plans to deliver 510 MDR treatment courses in year 2013 plus additional 300 courses based on savings. In 2014 and 2015, 520 and 530 SLD treatment courses will be delivered accordingly. MSF and ICRC will provide 125 and 30 SLD treatment courses in 2013. There are several problems related to SLD management: unfortunately DR was not considered at all; WHO recommended extending intensive phase of treatment up to 8 months, and drug calculation took place at the time when intensive phase of treatment was recommended up to 6 months; difference in the cost of injectable drugs is significant; there is no software at National TB Center to trace SLD consumption; in some cases physicians started treatment without availability of SLD for the whole course.

It was noted that the National team needs to be strengthened on case management, especially for drug resistance cases.

There is a plan for coordination of training activities for TB specialists, laboratory technicians and nurses.

Recommendations

Drug management system needs to be strengthened and it should be discussed in TRG who is going to take a leading role in SLD procurement.

5. Meeting with E. Kuhranova, GFATM acting Project manager, Project HOPE, , E. Abdullaeva, M&E specialist

It was agreed to continue active collaboration between Project HOPE, GFATM and Quality project, several activities were done jointly in the past. Dr. Kuhranova mentioned that the Quality project support in drug management activities will be helpful to strengthen National TB program.

Recommendations

Continue thorough coordination between Project HOPE GFATM and Quality project for cost-effective interventions on both sides.

6. The visit of FPG Novopokrovka (round table) Barton Smith, Director of M&E

Visit was conducted to get familiar with TB case detection and treatment, and infection control at PHC level facilities.

18 family physicians participated at the round table. Main points for discussion were:

1. Role of PHC in TB suspect identification, referral and treatment of TB cases at the intensive/continuation phase of treatment
2. Coordination between PHC and TB services

Recommendations

Cohort TB data has to be discussed on the regular basis with PHC physicians, TB specialists and administration of the rayon.

7. Meeting with Sara S. Feinstein Quality Project country manager and Chinara Kamarly, USAID- Health Officer

Acknowledgement was made for well-prepared trip by Quality country team. Trip activities were well and wisely prepared that allowed to accomplish all points in accordance with SOW.

Some of the main points that had been discussed were:

- Infection control on PHC level should be enhanced;
- Laboratory network strengthening;
- Monitoring & Evolution of TB project;
- Electronic database;
- Ambulatory treatment pilot;
- Drug management.

8. Participation in the meeting organized by GFATM grant portfolio manager

Meeting aimed to introduce new GFATM grant portfolio manager for Kyrgyzstan, discuss implementation of GFATM grants in the country, mostly related to access of patients to treatment with second line TB drugs.

National MDR TB plan should be approved by MoH, the final version has been sent to the government of Kyrgyzstan and approval is expected by the end of March. Enhancement of drug management system was discussed as well as coordinated work of different organization involved in drug procurement.

Annex I: Detailed SOW by country

2.1 Kazakhstan:

1. The consultant will be briefed by the Quality project TB team prior to continuing his consultant visit.
2. The consultant will debrief with the Quality project TB team prior to departing the region. If requested the consultant will debrief the USAID team.

2.2 Tajikistan:

1. The consultant will visit pilot of Dushanbe, Vakhdat rayon to assess and review ongoing activities and existing problems in PHC outpatient treatment. The consultant will provide technical assistance and provide recommendations to achieve results according to plans and goals of the project.
2. The consultant will meet with TJK Quality Project team, the country director, TB Director, Laboratory and CAH coordinators to discuss the plan Y3, the project vision, achievements, and problems creating barriers to implementation of the project.
3. The consultant will meet representative of MoH and NTP to discuss needs of technical assistance in the areas recommended by USAID, also to meet other partners as UNDP and Project HOPE PIU GFATM, TBCAREI, Dialog on HIV and TB, MSF and KfW to discuss collaboration and coordination on implementation of the National TB program.
4. The consultant will analyze TB data and status of implementation in Quality Project pilot sites for Pilot of PHC outpatient treatment, Laboratory, ACSM and other work approved by the donor.
5. The consultant will share experience of outpatient TB treatment and GeneXpert implementation (achievements and lessons learned) in other countries with the NTP and other partners during workshop organized by Quality project.

2.3 Kyrgyzstan:

1. The consultant will visit Issyk Ata rayon (PHC outpatient treatment and GeneXpert implementation pilot) to directly assess ongoing activities and existing problems. During the visit the consultant will meet with Rayon Health authorities, FMC and TB staff, and will provide technical assistance and recommendations to achieve results according to plans and goals of the project.
2. The consultant will follow-up to his previous visits to Kyrgyzstan and develop recommendations based on USAID's new guidance to the project.
3. The consultant will meet with KG Quality Project team, the country director, TB Director, Laboratory and DM coordinators to discuss the plan Y3, achievements and lessons learned during project implementation.
4. The consultant will meet representatives of the MoH and NTP to discuss needs of technical assistance in the areas recommended by USAID, also to meet other partners as UNDP and Project HOPE PIU GFATM, TBCAREI, Dialog on HIV and TB, ICRC, MSF to discuss collaboration and coordination on implementation of TB program

5. The consultant will assess practices in Quality Project pilot sites for Pilot of PHC outpatient treatment, Laboratory, ACSM and other components as approved by USAID.
6. The consultant will facilitate a training session for NTP and QHCP staff (20 staff) on TB epidemiology with cohort analyses and application of surveillance system for quality improvement of TB diagnosis, treatment, and prevention.

Annex J: People met

People met:		
Name	Title	Affiliation
1. D.Elkins	COP, QHCP	QHCP Regional office
2. G.Tsogt	Regional TB advisor	QHCP Regional office
3. T.Mohr	Regional TB manager	QHCP Regional office
4. B.Babamuradov	Regional TB technical director	QHCP Regional office
5. N.Musanvoa	Regional M&E director	QHCP Regional office
6. E.Belova	CAH Coordinator	KZ Quality Project
7. Sh.Maretbayeva	DM Coordinator	KZ Quality Project
8. S.Pak	Regional Senior TB Consultant	TB CAREI
9. A.Tursunbayeva	Regional M&E specialist	TB CAREI
10. B.Kim	Regional Lab specialist	TB CAREI
11. T.Pushkina	Program coordinator	TB CAREI
12. A.Bobohodjaev	Head of National TB Center	National TB Center, TJK
13. M.Mahmudova	Country manager, TJK	TBCAREI
14. Z.Maksumova	Manager of GFATM (TB)	PIU GFTAM (UNDP),TJK
15. T.Aptekar	Country director, PR GFATM TB grant	Project HOPE, TJK
16. J.Ismoilova	Deputy country director,	Project HOPE, TJK
17. Sh. Kholov	Manager of Vakhdat City Polyclinic	Vakhdat City Polyclinic
18. V.Kurbanov	Deputy manager of Vakhdat City Polyclinic	Vakhdat City Polyclinic
19. A. Islomov	Head of TB center	Vakhdat rayon
20. F.Abdulloeva	Head of NGO “Avesto”	Polyclinic #2, Dushanbe city
21. S.Yusupova	TB doctor	Polyclinic #2, Dushanbe city

22. Jeff Leimarre	Technical officer	Expand TB
23. Rayan Hose Ruiz	Technical adviser	GFATM UNDP
24. M.Karimov	Lab specialist	GFATM UNDP
25. M.Sheridan	Country manager,	QHCP TJK
26. A.Mahmudov	Deputy country manager	QHCP TJK
27. R.Adilbekova	TB director	QHCP TJK
28. A.Elnazarova	CAH coordinator	QHCP TJK
29. Z.Baydulloeva	Lab coordinator	QHCP TJK
30. B.Salihov	TB specialist	QHCP TJK
31. M.Imanaliev	Director of Republican Center Epidemiology & Informatics	National TB Center KG
32. M.Ibragimova	TB physician	Issyk Ata rayon
33. N.Usenbaev	Head of Monitoring & Evaluation	National SES center KG
34. B.Myrzaliev	Director KNCV branch office in KG	TB CAREI
35. R.Mazitov	Technical officer	TB CAREI
36. E.Kuhranova	Acting manager	PR GFATM grant/Project HOPE
37. E.Abdullaeva	M&E specialist	PR GFATM grant/Project HOPE
38. S.Feinstein	KG Country Manager	QHCP KG
39. T.Murzabekova	TB Director	QHCP KG
40. K.Takeeva	Laboratory coordinator	QHCP KG
41. Zh. Ysykeeva	Drug management specialist	QHCP KG/Project HOPE
42. B.Smith	Deputy Director for Quality Improvement	QHCP KG
43. R.Cholurova	Quality Improvement Specialist	QHCP KG
44. S.Asankhodjaeva	Deputy Country manager	QHCP KG
45. J.Junushalieva	Head of FGP Novo Pokrovka	Issyk Ata rayon

46. I. Shelokova	TB Grant coordinator	PR GFATM grant, UNDP
47. V. Kazanceva	Deputy Head of FMC	Issyk Ata rayon
48. M.Imanaliev	Director of Republican Center Epidemiology & Informatics	National TB Center KG
49. M.Ibragimova	TB physician	Issyk Ata rayon
50. N.Usenbaev	Head of Monitoring & Evaluation	National SES center KG
51. B.Myrzaliev	Director KNCV branch office in KG	TB CAREI
52. R.Mazitov	Technical officer	TB CAREI

Annex K

Kyrgyzstan

| High MDR-TB burden |

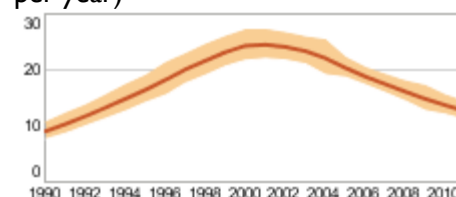


World Health
Organization

Tuberculosis profile

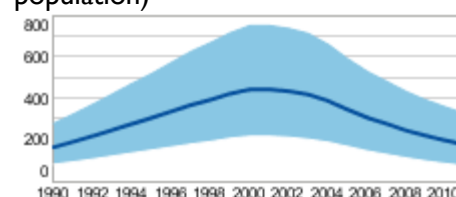
Population 2011		5.4 million	
Estimates of TB burden * 2011		Number (thousands)	Rate (per 100 000 population)
Mortality (excludes HIV+TB)		0.6 7 (0.59–0.76)	12 (11–14)
Prevalence (includes HIV+TB)		9.4 (3.9–17)	17 5 (71–324)
Incidence (includes HIV+TB)		6.9 (5.7–8.2)	12 (106– 8 153)
Incidence (HIV+TB only)		0.1 (0.087– 20.16)	2.2 (1.6–2.9)
Case detection, all forms (%)		80 (67–97)	
TB case notifications 2011			
New cases		(%) Retreatment cases	(%)
Smear-positive	1 (30 537)	Relapse	349 (32)
Smear-negative	2 (41 125)	Treatment after failure	
Smear-unknown / not done	0 (0)	Treatment after default	
Extrapulmonary	1 (29 518)	Other	725 (68)
Other	0 (0)		
Total new	5 180	Total retreatment	1 074
Other (history unknown)			
Total new and relapse	5 529	Total cases notified	6 254
New cases	Smear- positive	Smear- negative/ unknown/ not done	Extrapulmonary
M:F ratio	1.4		
Age < 15	19		
Laboratories			2011
Smear (per 100 000 population)			2.3
Culture (per 5 million population)			3.7

(Rate per 100 000 population
per year)



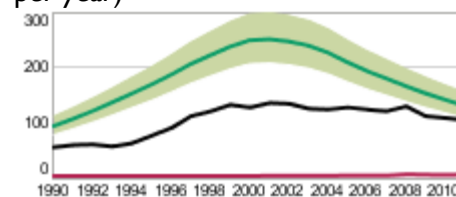
Mortality (excludes
HIV+TB)

(Rate per 100 000
population)



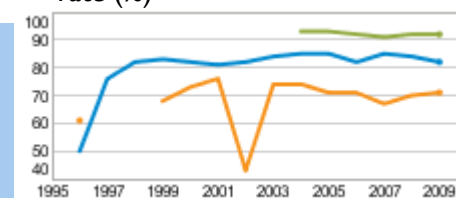
Prevalence

(Rate per 100 000 population
per year)



Notifications
Incidence
Incidence (HIV+TB
only)

Treatment success
rate (%)



New smear-positive and/or
culture-positive
New smear-
negative/extrapulmonary

Drug susceptibility testing (per 5 million population)	2.8
Is second-line drug susceptibility testing available?	Yes, in country
Is there a national reference laboratory?	Yes

Treatment success rate 2010 (%)

New smear-positive and/or culture-positive	Is rifampicin used throughout treatment for new patients?	Yes
New smear-negative/extrapulmonary		
Retreatment		

TB/HIV 2011	Number (%)
TB patients with known HIV status	153 (2)
HIV-positive TB patients	
HIV-positive TB patients on co-trimoxazole preventive therapy (CPT)	79
HIV-positive TB patients on antiretroviral therapy (ART)	
HIV-positive people screened for TB	153
HIV-positive people provided with IPT	4

Estimates of MDR-TB burden 2011*	New	Retreatment
% of TB cases with MDR-TB	26 (23–31)	52 (45–58)
MDR-TB cases among notified pulmonary TB cases	97 (830–10100)	550 (490–620)

Reported cases of MDR-TB 2011	New	Retreatment	Total
Cases tested for MDR-TB	451 (29%)	232 (22%)	806
Laboratory-confirmed MDR-TB cases	451	232	806
Patients started on MDR-TB treatment			492

Financing TB control	2012	2013
Total budget (US\$ millions)	9.3	
Available funding (US\$ millions)	<1	
% of budget funded	<1	
% available funding from domestic sources		
% available funding from the Global Fund		

Retreatment

(Number of patients)



HIV-positive TB patients
on CPT on ART

(US\$ millions)



Total budget Available funding

Tajikistan

| High MDR-TB burden |



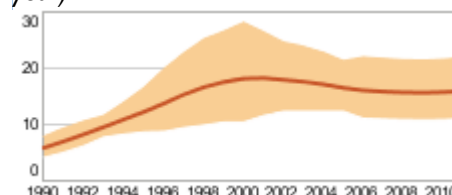
Population 2011		7 million
Estimates of TB burden * 2011	Number (thousands)	Rate (per 100 000 population)
Mortality (excludes HIV+TB)	1.1 (0.76–1.5)	16 (11–22)
Prevalence (includes HIV+TB)	24 (12–41)	350 (170–593)
Incidence (includes HIV+TB)	13 (11–16)	193 (159–230)
Incidence (HIV+TB only)	0.25 (0.19–0.32)	3.6 (2.7–4.5)
Case detection, all forms (%)	47 (39–57)	

TB case notifications 2011			
New cases	(%) Retreatment cases	(%)	
Smear-positive	2 (37) Relapse	355 (38)	
	174		
Smear-negative	2 (36) Treatment after failure	198 (21)	
	148		
Smear-unknown / not done	0 (0) Treatment after default	67 (7)	
Extrapulmonary	1 (27) Other	309 (33)	
	613		
Other	0 (0)		
Total new	5	Total retreatment	929
	935		
Other (history unknown)	745		
Total new and relapse	6	Total cases notified	7
	290		609

New cases	Smear-positive	Smear-negative/unknown/not done	Extrapulmonary
M:F ratio	1.2	1.4	1.3
Age < 15	39	137	393

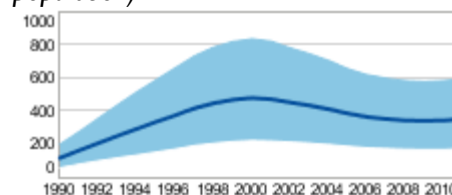
Laboratories 2011	
Smear (per 100 000 population)	1.3
Culture (per 5 million population)	2.1
Drug susceptibility testing (per 5 million population)	0.7
Is second-line drug susceptibility testing available?	Yes, outside country
Is there a national reference laboratory?	Yes

(Rate per 100 000 population per year)



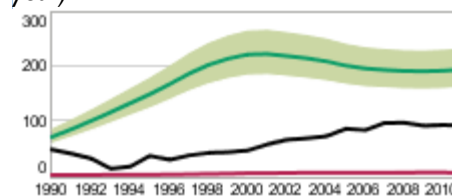
Mortality (excludes HIV+TB)

(Rate per 100 000 population)



Prevalence

(Rate per 100 000 population per year)



Notification
Incidence
Incidence (HIV+TB only)

Treatment success rate (%)



New smear-positive and/or culture-

Treatment success rate 2010 (%)		
New smear-positive and/or culture-positive	80	
New smear-negative/extrapulmonary	90	Is rifampicin used throughout
Retreatment	72	treatment for new patients?

TB/HIV 2011	Number (%)
TB patients with known HIV status	6 241 (82)
HIV-positive TB patients	1 15 (2)
HIV-positive TB patients on co-trimoxazole preventive therapy (CPT)	81 (70)
HIV-positive TB patients on antiretroviral therapy (ART)	66 (57)
HIV-positive people screened for TB	1 022
HIV-positive people provided with IPT	315

Estimates of MDR-TB burden 2011*	New	Retreatment
% of TB cases with MDR-TB	13 (9.8–16)	54 (48–59)
MDR-TB cases among notified pulmonary TB cases	54 (420–670)	500 (450–550)

Reported cases of MDR-TB 2011	New	Retreatment	Total
Cases tested for MDR-TB	161 (7%)	415 (45%)	576
Laboratory-confirmed MDR-TB cases	72	308	604
Patients started on MDR-TB treatment			380

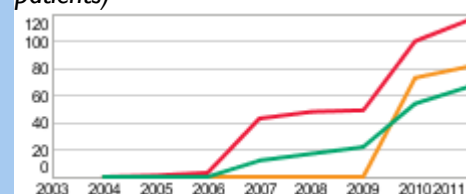
Financing TB control	2012	2013
Total budget (US\$ millions)	37	45
Available funding (US\$ millions)	16	18
% of budget funded	42	41
% available funding from domestic sources	28	25
% available funding from the Global Fund	38	35

* Ranges represent uncertainty intervals

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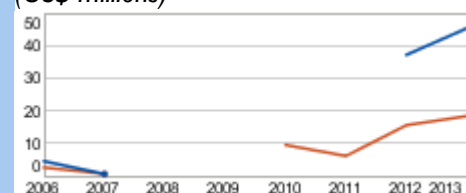
positive
New smear-negative/extrapulmonary
Retreatment

(Number of patients)



HIV-positive TB patients
on CPT on ART

(US\$ millions)



Total budget Available funding

Data: www.who.int/tb/data